Video Conferencing

Closing Distance, Improving Learning

Presenters: Mr. Carl Taylor and Mr. Samir Maniar

(Prairie View) (SCSU)

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Video Conferencing

- Videoconferencing is the ideal way to bring geographically dispersed people together, face-to-face, to facilitate decision-making and productive collaboration.
- Videoconferencing used to be the technology that everyone planned to install sometime in the future-once they ironed out all the bugs and the technology could be had for a reasonable price.
  - That time has arrived.

Video Conferencing

- The price of videoconferencing has come down considerably.
- Key PC players have taken steps to bring this valuable technology to the desktop at a price that corporate and educational budgets can afford.
- Video networking is the network that supports Video Conferencing.
- Connections can be to directed to multiple locations at different bandwidths, on a call-by-call basis.

Group Video Conferencing

- One or more people sharing/using one system for video communication to the remote sites.
- Who should use GVC system?
  - If video conferencing requirement involves many people or group of people using the system at one time then - YOU should have Group VC system.
- Where should you Install?
  - It is recommended that you install this type of system in a one large room. It is also necessary to have the easy access to video conferencing components and access to the network(LAN/WAN)

GVC - Continued

- Why should you use GVC system?
  - First of all, many users can share the same system at one time. It gives you the true meaning of the Group Video Conferencing between one or more remote sites.
  - It offers the high speed connectivity and we will see the details on this in later section.
  - It offers multiple Audio/Video options for video conferencing standards.
  - This type of system comes with all the necessary components in one box, and it is much cost effective and easy to install and use.

GVC -Hardware

- Basic Hardware for Group Video Conferencing System is as given below:
  - Display Unit or Monitor/TV
  - Capturing Camera
  - Speaker and Microphone
  - Computer System
  - CODEC (Compression/De-Compression)Unit
- Most of the GVC system in market today comes with all of the above described components.

GVC - Hardware - Continued.

- One more required component is the high speed communication line.
- ISDN (Integrated Services Digital Network) communication line is the widely used and accepted method for the purpose of video conferencing.
- With the inclusion of ISDN line - one more component is required that is IMUX or Inverse MUltipleXer. This unit connect multiple ISDN lines and creates a wider pipeline for use by GVC system.

Communication Line - ISDN

- Minimum bandwidth of a ISDN line is 64 kbps.
- The minimum required bandwidth or speed for Video Conferencing is 128 KBPS (2 x 64) or 1 BRI circuit line.
- The recommend bandwidth for video conferencing data transfer is 384 KBPS or 3 BRI circuits.
- The speed of 384 KBPS or 3 BRI gives a real boost in performance and smooth image transmission in video conferencing.

ITU Standards

- ITU - International Telecommunication Union
- ITU - a part of United Nations (UN) and a body responsible for defining standards in video conferencing components.
- ITU has defined 3 classes for Video Conferencing.
  - Class 1 => minimum requirements and support
  - Class 2 => Class 1 + some optional features
  - Class 3 => supports all available features & options
- Will look at each of these in conjunction with Audio standards and Video standards.

Video Encoding & Compression

- ITU has defined many standard for compression.
- H. 261
  - Earlier standard for video encoding - supports only NTSC data format and at a max speed of 384 KBPS.
- H.320
  - Widely used and internationally accepted standard for video compression - supports both NTSC and PAL - works well with data rate of 64 KBPS - 1.544 MBPS.
- H.323
  - A standard for compression and encoding dedicated to be used for Video Conferencing over LAN/WAN - this works over the IP/IPX Local Area Network.

Video Compression - Continued

- H.324
  - newest among the core - dedicated for desktop video conferencing using 28.8 KBPS modem lines.
- The selection of standard is based on the system that you purchase and the bandwidth that is available to you.
- Most all system do support the H.320 standards, but H.261 is the native standard for most of the group video conferencing system.
- Class 1 system supports only H .261, while Class 2 and 3 system support H.261 and H.320.

Audio Encoding & Compression

- ITU also has some defined standards for Audio Compression.
- G. 711
  - Earlier standard - Uses 48-64kbps of bandwidth - gives 3 kHz Telephone Quality Sound.
- G. 722
  - Popular standard - Uses 48-64kbps of bandwidth - gives 7 kHz Stereo Quality Sound.
- G. 728
  - newer standard - used with desktop video conferencing and uses 16 KBPS and gives telephone quality sound.

Audio Compression - Continued.

- Class 1 type of system supports only G.711 while Class 2 and 3 supports all the audio standards.
- Now, what kind of audio quality you can afford is dependent on the available ISDN bandwidth.
- These compression standards are choices within most systems and you can choose on per need basis.
- The recommendations are to have H.320 compliant system and use G.722 as the audio standard with 3 BRI ISDN bandwidth.

Critical Success Factors

- Cost of application and WAN access equipment
- No. of video conferencing stations per location
- Average volume of videoconference calls (hours/day) that you will make
- Size and type of the WAN connection required to handle that volume (BRI,PRI,T1,E1)
- Network transport services (private Vs. public Vs. virtual connections)
- Support for multiple carrier standards (regional and country-specific)
- Life-cycle costs (the cumulative of ownership)

Videoconferencing Application

- Video conferencing equipment (CODECs, cameras and other peripherals) is available in various configurations
  - including dedicated room systems
  - roll-about systems
  - desktop products
- Video conferencing is highly valuable because it enables businesses and educational facilities to conduct high-content, visual communications over distances that otherwise could only be bridged by time-consuming travel.
- The longer the distance the higher the value.

True Cost of Videoconferencing

- Bulk cost of ownership of a WAN videoconferencing system is not the video application equipment (CODEC, cameras) or even the WAN access equipment (Imux, switch), but in the wide area network costs.
- WAN video networks are dominated by carrier charges.
- Cost figures are significant unlike the one-time equipment charges.
- Local and long-distance carrier service is an ongoing expense.

Videoconferencing Transport Services

- Network transport services come in three basic varieties
- Public Switched Digital
  - a digital transport service that is available in bandwidths of switched 56/64 KBPS.
- Dedicated-Private Network
  - typically available via T1/E1 access lines. This service is also provided in fractions of T1.
- Virtual-Private Network
  - a special switched network service that carriers typically offer to high-volume customers which commits to a long-term agreement in return for a substantial discount on basic service.

Featured System - VTEL TC2000

- VTEL - A Texas based corporation has many products in the market of Video Conferencing.
- Shown here is a picture of VTEL's TC2000 Video Conferencing system. This System comes with two 35" monitor, camera , microphone, speaker and its proprietary PC with built in CODEC and Inverse MUltipleXer units.

- The competitive system to this one is VENUS 2000 Model 30 and Model 50 from PictureTel Inc.